DOCUMENT RESUME

ED 038 099 HE 001 446

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TITLE	Predicting Success for University Freshmen; Updating of Procedure. Indiana Studies in Prediction, Number One, Supplement 3.
INSTITUTION	Indiana Univ., Bloomington.
PUB DATE	Feb 70
NOTE	9p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.55
DESCRIPTORS	Achievement Tests, *College Freshmen, *Grade Point Average, *Grade Prediction, Grades (Scholastic), *Higher Education, *Prediction, Predictive Validity

ABSTRACT

In the fall of 1961, the Bureau of Educational Studies and Testing developed a procedure for predicting the first semester grade point average (GPA) of entering freshmen at Indiana University from a combination of their CEEB Scholastic Aptitude Test (SAT) scores and their high school ranks. This procedure was updated in 1965. The 1969 revision is reported in this monograph. Using first semester GPA as the criterion to be predicted, the SAT scores -- Verbal, Mathematics and Sum (Verbal and Mathematics) were maximally weighted with high school rank to produce the most accurate prediction. This analysis was conducted separately for men and women. Predicted grade point averages were classified in four categories and were used in developing the GPA probability tables. (AF)

ED038099

INDIANA UNIVERSITY / 1970

Predicting Success for University Freshman

Up-dating of Procedure

INDIANA STUDIES IN PREDICTION

NUMBER ONE

Supplement III

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HE001446

Bureau of Educational Studies and Testing

INDIANA UNIVERSITY / 1970

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INDIANA STUDIES IN PREDICTION: NO. 1
Supplement III

PREDICTING SUCCESS FOR UNIVERSITY FRESHMEN

In the fall of 1961, the Bureau of Educational Studies and Testing developed a procedure for predicting the first semester grade point average (GPA) of entering freshmen at Indiana University from a combination of their CEEB Scholastic Aptitude Test (SAT) scores and their high school ranks (HSR). Due to the changing nature of the freshmen population, the procedure was updated in 1965. This supplement is the second revision of the procedure based on the entering freshmen class of fall, 1968.

Using first semester GPA as the criterion to be predicted, the SAT scores--Verbal, Mathematics and Sum (Verbal + Math) were maximally weighted with HSR to produce the most accurate prediction. This analysis was conducted separately for men and women. Results of the analysis are shown in Table 1.

TABLE 1. RELATIONSHIPS BETWEEN SAT SCORES, HIGH SCHOOL RANK AND THE CRITERION VARIABLES OF FIRST SEMESTER GRADE POINT AVERAGE.

Predictor Variables	Zero-Order Correlation	% of GPA variance accounted for by each variable or combination of variables	
Men (N = 2063)			
SAT - Verbal	.37	13.7	
SAT - Math	.41	16.8	
SAT - Sum	.44	19.4	
HSR	-.47	22.1	
Combination I	.53	28.0	
SAT V			5.5
SAT M			6.9
HSR			15.6
Combination II	.53	28.0	
SAT Sum			12.4
HSR			15.6
Women (N = 2054)			
SAT - Verbal	.44	19.3	
SAT - Math	.47	22.1	
SAT - Sum	.51	26.0	
HSR	-.49	24.0	
Combination I	.58	33.7	
SAT V			7.7
SAT M			10.2
HSR			15.8
Combination II	.58	33.6	
SAT Sum			17.9
HSR			15.7

For both men and women the weighted combination of SAT Verbal and SAT Math with HSR produced the same multiple correlation as the SAT Sum and HSR. Therefore, the probability tables are based on the weighted combination of Sum and HSR. The formulas for maximally weighting Sum and HSR along with the standard error of estimate to obtain the predicted GPA's are given below:

Women (N = 2054)

Predicted GPA =

-0.15822(HSR) + 0.00158(SAT TOTAL) + 1.35336

SE_{EST} = 0.6231

Men (N = 2063)

Predicted GPA =

-0.13178(HSR) + 0.00121(SAT TOTAL) + 1.55268

SE_{EST} = 0.6235

The formulas noted above were used in determining a predicted GPA for each freshman student in the fall of 1968. The predicted grade point averages (PGPA) were then classified into four categories as follows: .00 to 2.00, Q; 2.00 to 2.50, R; 2.50 to 3.00, S; 3.00 and above, T. Their coded PGPA's were used in developing the GPA probability tables which follow.

TABLE 2. PROBABILITY GROUP CHART FOR MEN

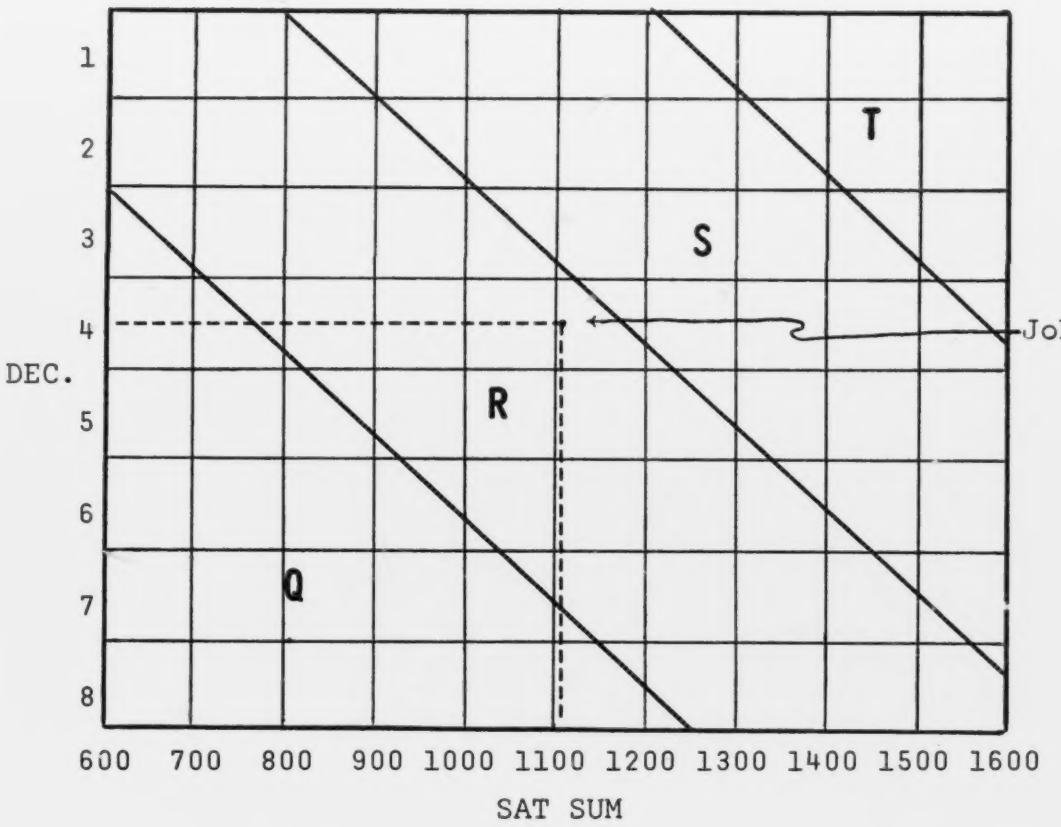

TABLE 3. PROBABILITY GROUP CHART FOR WOMEN

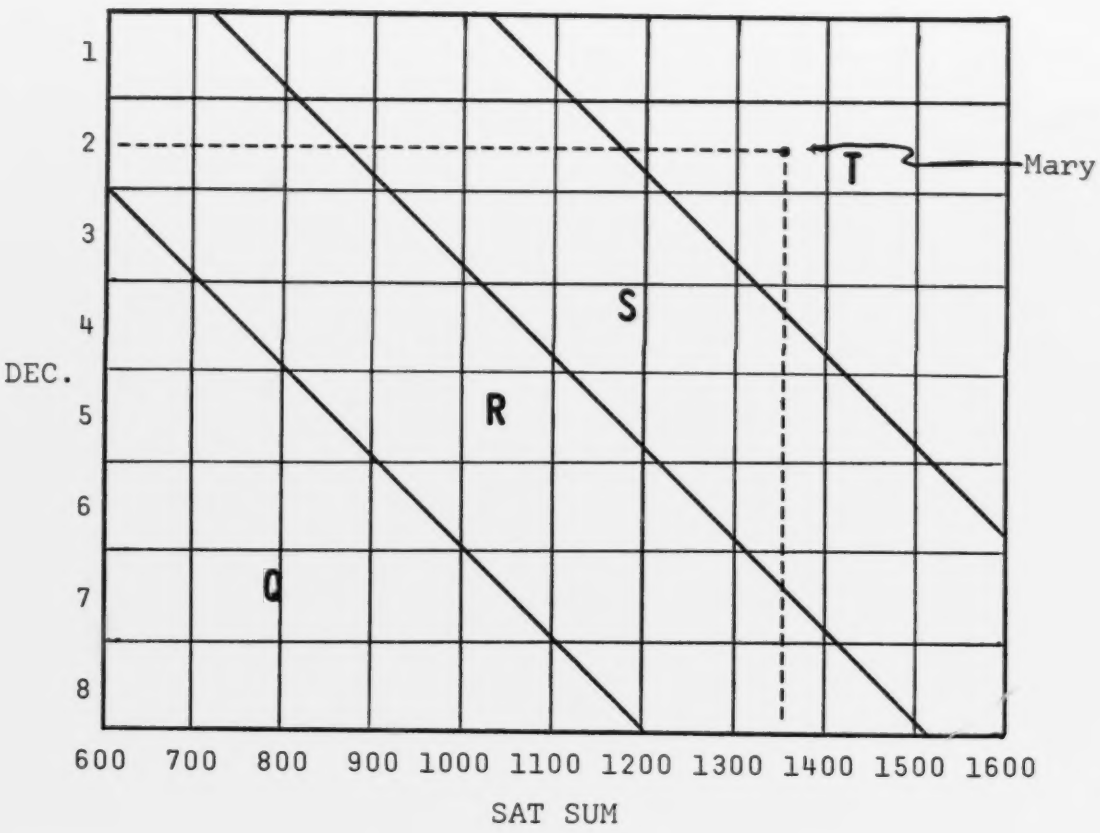

TABLE 4. PROBABILITY GROUP DISTRIBUTIONS IN PERCENT

PROBABILITY GROUP

GPA	Q Men	Q Women	R Men	R Women	S Men	S Women	T Men	T Women
	%	%	%	%	%	%	%	%
4.00	3	2	12	14	39	40	79	73
3.00	49	40	56	57	49	49	14	24
2.00	44	54	30	25	11	10	6	3
1.00	5	4	2	4	1	1	1	0
0.00								

GPA	Q		R		S		T	
Above 2.00	51	42	68	71	88	89	93	97
Below 2.00	49	58	32	29	12	11	7	3

NOTE: Since students in probability group Q have a lower chance of attaining a GPA better than 2.00, their programs should be carefully planned so that they are not overloaded with coursework too burdensome for them.

CAUTION: These tables do not apply to specially admitted students such as Project '69 students.

GRADE POINT AVERAGE PROBABILITY TABLES

Advisers often want to know the chances of success for students in college. Objective predictions of success can be made by an analysis of the achievement of previous freshmen classes. The Bureau of Educational Studies and Testing has revised the prediction formulas and has provided a procedure which quickly gives a good estimate of a student's chances of success at various points on the grade point average (GPA) range. Advisers should use Tables 2, 3, and 4 in course selection decisions for students and in gauging student progress during the semester.

DIRECTIONS FOR USE OF THE TABLES 2, 3, and 4

Two easily obtainable numbers are needed to use the tables:

1. SAT SUM: this number is obtained by adding the student's SAT V and SAT M scores printed on his data sheet.

2. DEC: this number is the student's decile rank in his high school class and is printed next to DEC on his data sheet.

On the basis of past performance of freshmen, SAT scores and high school rank have been combined by an optimal weighting procedure to produce the probability tables. Refer to Table 2 or 3 corresponding to the student's sex and read up to the point where his SAT SUM intersects with his DEC. (The student's position between the lines should be approximated.) The point at which the two lines intersect will lie in one of the four probability group letter areas Q, R, S, or T. Consider both probability letter groups for borderline cases.

Using the student's probability group letter, refer to Table 4 labeled Probability Group Distributions in Percent. Read the various probabilities of success for the student in GPA units within the probability letter column appropriate to his sex.

Here is an example:

> John has a SAT SUM of 1100 (SAT V = 600, SAT M = 500) and a DEC rank of 4, placing him in probability group R. Referring to the group labeled R in Table 4, we see that 2 percent of men like John usually get a GPA below 1.00, 30 percent usually get a GPA between 1.00 and 2.00, 56 percent between 2.00 and 3.00, and 12 percent above 3.00. The chances are approximately 7 in 10 that John will get a GPA above 2.00 his first semester.

Another example:

> Mary has a SAT SUM of 1350 (SAT V = 650, SAT M = 700) and a DEC rank of 2, placing her in group T. Referring to the group labeled T in Table 4 we see that 0 percent of women like Mary usually get below 1.00, 3 percent usually get a GPA between 1.00 and 2.00, 24 percent between 2.00 and 3.00, and 73 percent above 3.00. Since the probability is very high that Mary will get above 3.00, she should be encouraged to consider honors course work.